

Description of a new species of the genus *Astyanax* (Characiformes: Characidae) from the rio Araguaia basin, Brazil.

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Description of a new species of the genus *Astyanax* (Characiformes: Characidae) from the rio Araguaia basin, Brazil. - *Astyanax kullanderi* sp.n. is described from the upper rio Araguaia basin, central Brazil. It seems to be closely related to *A. validus* Géry, Planquette & Le Bail and *A. superbus* Myers by the common apomorphic colour pattern, and distinguished from them by a combination of characters involving number of anal fin rays, lateral line scales, and predorsal scales and gill-rakers, and absence of maxillary teeth.

Key-words: Pisces - Characidae - *Astyanax* n. sp. - Brazil.

INTRODUCTION

Astyanax Baird & Girard is a speciose genus, containing about 60 species occurring between southern United States and central Argentina (EIGENMANN 1917; GÉRY 1978). Although some species are currently poorly diagnosed and taxonomical problems involving widespread species (probably species complex) such as *A. fasciatus* (Cuvier) and *A. bimaculatus* (Linnaeus) are not solved, most species may be easily recognized on the basis of teeth morphology and number, colour pattern and meristics. In the present paper, a new species from the upper rio Araguaia basin in Mato Grosso, central Brazil, is described.

MATERIAL AND METHODS

Methods for counts of fin-rays, scales, vertebrae, and gill-rakers follow FINK & WEITZMAN (1974). Measurements are made according to FINK & WEITZMAN (1974), except for: body depth, vertical measure immediately anterior to dorsal fin origin; body width, transverse measure immediately in front dorsal fin base; head depth, vertical

measure through the posterior edge of opercular bone; and, head width, the largest transverse length crossing the head. Tooth and dental cusp counts are made from the medial to the distal portion of jaw bones. Cleared and counterstained specimens prepared according to TAYLOR & VAN DYKE (1985). Abbreviations for institutions are: MHNG – Muséum d'histoire naturelle, Genève; MNRJ – Museu Nacional do Rio de Janeiro; MZUSP – Museu de Zoologia da Universidade de São Paulo; NRM – Naturhistoriska Riksmuseet, Stockholm, and UFRJ – Universidade do Rio de Janeiro.

***Astyanax kullanderi* sp.n.**

(Fig. 1-2)

HOLOTYPE. MNRJ 12427, 57.2 mm SL; Brazil: Estado de Mato Grosso, stream tributary of rio Perdidos, rio das Mortes drainage, close to the road BR-070, about 10 km W of Primavera do Leste, 15°32'S, 54°18'W; S.O. Kullander, A. Hoggeborn-Kullander, K. Tanizaki & M.T. Lacerda, 19.X.1989.

PARATYPES. UFRJ 1290, 7 ex., 35.6-64.4 mm SL; MHNG 2542.17, 3 ex., 37.4-55.3 mm SL; NRM uncatalogued, 4 ex., 34.7-55.2 mm SL; MNRJ 12428, 5 ex., 36.4-56.6 mm SL; MZUSP 45288, 3 ex., 40.7-51.3 mm SL; UFRJ 1291, 4 stained and cleared ex., 36.7-47.6 mm SL; all collected with holotype.

DIAGNOSIS. Distinguished from all other species of the genus by the combination of the following features: no maxillary tooth; two humeral spots, the first one black, well defined, longitudinally ovate, and with faint vertical expansions of dark pigment above and below; gray to black zigzag lines between longitudinal rows of scales; scales in lateral series 31-32; scales in predorsal series 10, irregularly distributed; and, anal fin rays 23-27.

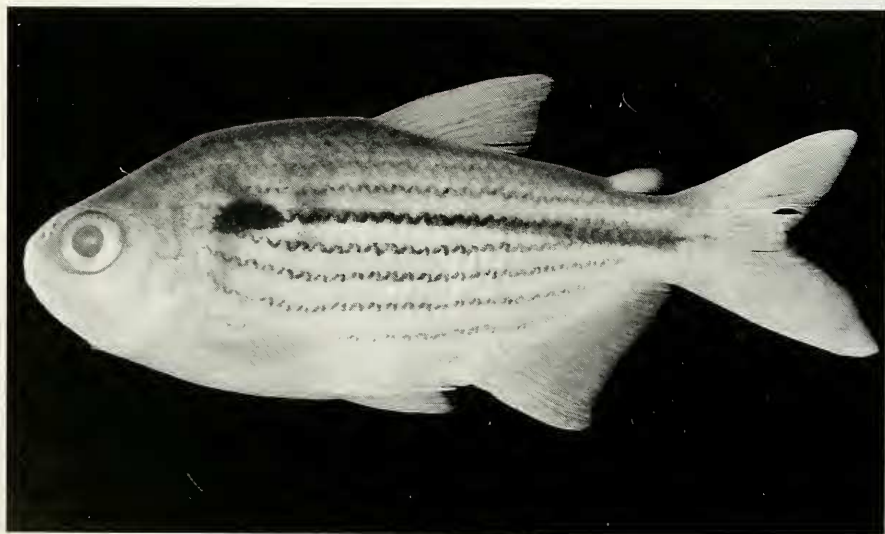


FIG. 1

Astyanax kullanderi, holotype, 57.2 mm SL, MNRJ 12427.

DESCRIPTION. Morphometric data are given in Table 1. Greatest depth at anterior dorsal fin origin. Dorsal head profile gently concave. Predorsal profile from nape to anterior dorsal fin origin slightly convex. Dorsal profile from dorsal fin origin to adipose fin origin, and from this point to dorsal procurent caudal fin rays concave. Ventral profile from the anterior tip of lower jaw to the base of last anal fin ray convex. Ventral caudal peduncle profile straight. Anal fin base slightly convex. Snout blunt, mouth terminal.

Origin of anal fin in a vertical through the base of last dorsal fin ray. Tip of pectoral fin reaching a vertical through the pelvic fin base. Tip of pelvic fin reaching between the urogenital papilla and the base of first anal fin ray. Distal margin of anal fin slightly concave. Caudal fin forked, dorsal and ventral lobes equal in size. Dorsal fin rays ii, 8, i; anal fin rays iii, 20-24; principal caudal fin rays i, 17, i; procurent caudal fin rays 11-13 + 10-11; pectoral fin rays i, 10-11, i; pelvic fin rays i, 7. Adipose fin present. Hooks on sides of last unbranched and first nine branched anal fin rays, and on first to fifth branched pelvic fin rays, all hooks curved and directed dorsally.

Scales in lateral series 31-32, all perforated; scales in transversal series 6 above lateral line, 5 below lateral line. Scales in predorsal series 10, distributed irregularly. Scale rows around caudal peduncle 16. Scales extending over about anterior 10% of caudal fin lobes.

Two teeth rows in premaxilla; outer row 4-5 teeth, gradually decreasing in length from the 1st to the last one, all tricuspidate, the median cusp longer; inner row 5 teeth, gradually decreasing in length from the 1st to the last one, 1st one longer than wide, other teeth approximately as long as wide, 1st tooth with 4 cusps, the 2nd cusp longer, 2nd and 3rd teeth with 5 cusps, the median cusp longer, and 4th and 5th teeth with 4 cusps, the 3rd cusp longer. No maxillary tooth. Dentary with one row of teeth; 4 anterior teeth gradually decreasing in length, 1st, 3rd and 4th teeth longer than wide, 2nd tooth as long as wide, 1st and 2nd with 6 cusps, the 2nd cusp longer, 3rd and 4th teeth with 4 cusps, the second cusp longer; 3-5 teeth posterior to and much smaller than 4 anterior ones, the 1st one tricuspidate or conical, other teeth conical. Branchiostegal rays 4. Gill-rakers 19-20. Infraorbital bones 6, the distal border of the 3rd one not reaching sensory tube of preopercle. Supraneurals 5. Vertebrae 16 + 19-20.

Colour in alcohol. Ground colour brown in dorsal region of body and head, becoming gradually yellow on sides. A black longitudinal stripe from humeral region to caudal fin base, becoming wider after posterior dorsal fin base, but no distinctive caudal spot. Brown to black zigzag longitudinal lines between longitudinal body rows of scales, darker in median region. A black, well defined, longitudinally ovate humeral spot, covering about 4 scales, with faint expansions above and below, and a second, more posterior, very faint and vertically elongate humeral spot. Small chromatophores over membranes of all fins. A few melanophores on median caudal fin region. Suborbital and opercular regions golden, with a few dark chromatophores.

ETYMOLOGY. Named after Sven O. Kullander, who collected the type series and made it available for study, as well as for his valuable contribution for neotropical Ichthyology.

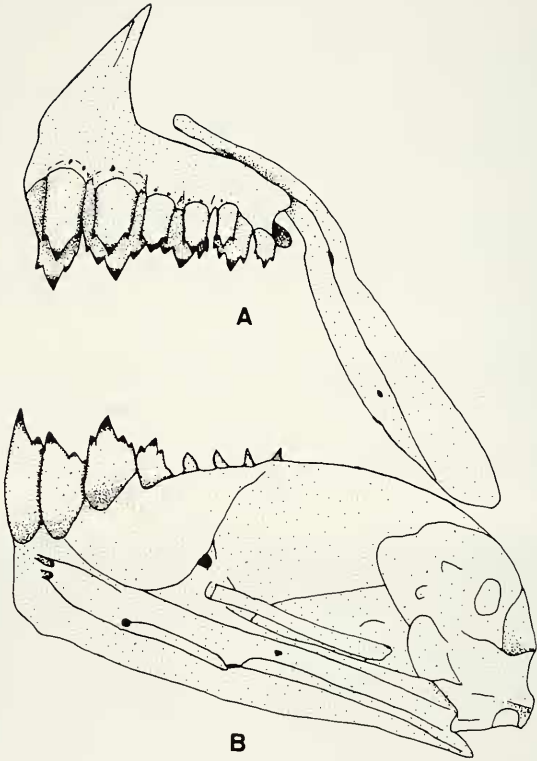


FIG. 2

Upper (A) and lower (B) left jaws of *Astyanax kullanderi* anterolateral view.

TABLE 1

Morphometric data of *Astyanax kullanderi*. Measurements 1-12 are expressed as % of standard length, 13-17 as % of head length. H: holotype.

	H		Paratypes					
Standard length (mm)	57.2	64.4	55.8	54.7	47.9	46.4	43.2	35.6
1. Body depth	42.4	43.7	44.4	41.0	41.5	39.7	38.3	37.8
2. Body width	16.0	17.2	18.7	15.6	15.4	14.1	14.4	14.2
3. Predorsal length	55.2	56.8	57.1	54.5	54.9	55.2	52.7	53.3
4. Prepelvic length	55.2	53.6	56.2	52.9	54.1	55.0	53.7	53.9
5. Caudal peduncle depth	13.5	12.7	13.3	13.4	14.0	12.7	12.5	12.1
6. Pectoral fin length	23.0	22.2	24.5	24.4	25.8	24.5	22.7	24.5
7. Pelvic fin length	18.4	16.9	19.4	20.0	19.4	19.8	17.5	19.1
8. Dorsal fin length	28.8	28.3	30.6	29.3	29.3	28.4	28.4	30.5
9. Dorsal fin base length	14.9	14.1	14.5	14.7	15.4	13.8	12.7	13.9
10. Anal fin base length	29.3	27.3	28.5	31.1	31.5	30.0	28.5	29.3
11. Head depth	36.2	33.8	35.2	33.7	35.2	33.3	33.2	33.1
12. Head length	27.4	26.5	27.9	27.5	28.6	28.4	28.9	29.4
13. Head width	61.0	61.0	64.3	57.8	59.5	56.8	54.0	54.1
14. Snout length	24.9	26.4	28.0	29.2	23.7	25.8	25.2	25.4
15. Upper jaw length	43.8	44.0	43.1	42.5	39.8	42.4	43.6	42.1
16. Eye diameter	35.1	33.1	36.7	36.5	38.7	42.0	38.4	37.8
17. Interorbital width	35.8	39.0	35.7	36.5	36.5	33.3	35.2	34.9

DISCUSSION

Species presently assigned to *Astyanax* have been grouped in the same genus by the common possession of: body completely scaled; few, if any tooth on maxilla; two series of premaxillary teeth, the inner row with 5 or more teeth; dentary with large, anteriorly positioned teeth, followed by other smaller teeth; series of lateral line pores complete; third infraorbital bone not in contact with sensory tube of preopercle; teeth not very compressed antero-posteriorly; caudal fin scaled only at its base; body not very elongate; maxilla not very long, upper jaw smaller than half of head length; and, scales not ctenoid (EIGENMANN 1917; GÉRY 1978). However, all these diagnostic characters are plesiomorphic or extremely labile in the Tetragonopterinae, and therefore do not indicate genus monophyly. In the same way, no monophyletic hypothesis for species groups within *Astyanax* is currently available.

Astyanax kullanderi presents a colour pattern of humeral spots consisting of a first ovate, well defined spot, with faint expansions of dark pigment above and below, and followed by a second, faint, vertical spot. Similar patterns are also present in some other *Astyanax* species such as *A. abramis* (Jenyns), *A. bimaculatus* (Linnaeus), *A. bourgeti* Eigenmann, *A. goyacensis* Eigenmann, *A. orthodus* Eigenmann, *A. poetzchkei* Ahl, *A. superbus* Myers, and *A. validus* Géry, Planquette & Le Bail, what may be an apomorphic condition, indicating close relationships. These species are currently placed in the subgenus *Poecilurichthys* Gill, by the common presence of scales irregularly distributed on predorsal series. Among those species, only *A. kullanderi*, *A. superbus*,

and *A. validus* have zigzag lines between longitudinal rows of scales, suggesting a close relationship. *Astyanax kullanderi* is distinguished from *A. superbus* by having fewer anal fin rays (23-27, vs. 29-33), fewer scales in lateral series (31-32, vs. 38-40), and no maxillary tooth (vs. 1-6). The new species further differs from *A. superbus* by the absence of caudal spot (vs. a caudal spot extending over median caudal fin rays), and a longitudinal black stripe on lateral midline (vs. no longitudinal stripe), and from *A. validus* by fewer gill-rakers on first arch (19-20 vs. 23).

Colour patterns comprising parallel longitudinal lines or spots rows on body sides also occur in other *Astyanax* species. *Astyanax bimaculatus* from the Paraguay and upper Madeira basins, *A. maximus* (Steindachner), and *A. saltor* Travassos have series of spots along the midline of each longitudinal row of scales, forming a pattern very distinct from *A. kullanderi* (lines between scale rows). *Astyanax lineatus* Perugia has a pattern of dark chromatophores around scales of body sides, chromatophores darker between the longitudinal rows of scales. This species does not present the diagnostic feature of the subgenus *Poecilurichthys*, not the colour pattern of humeral region above described, therefore considered a species not closely related to *A. kullanderi*.

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REFERENCES

- EIGENMANN, C.H. 1917. The American Characidae, part 1. *Mem. Mus. Comp. Zool.* 43(1): 1-102.
FINK, W.L. & S.H. WEITZMAN 1974. The so-called cheirodontin fishes of Central America with descriptions of two new species (Pisces, Characidae). *Smithson. Contr. zool.* 172: 1-46.
GÉRY, J. 1978. Characoids of the world. *TFH Publications, Neptune City*, 672 pp.
TAYLOR, W.R. & G.C. VAN DYKE 1985. Revised procedures for staining and clearing small fishes and other vertebrates for bone and cartilage study. *Cybium* 9(2): 107-109.